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A Preliminary Study to investigate the prevalence of pain in elite Dressage Riders during competition, in the United Kingdom

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Abstract

Equestrianism is more dangerous than many sports including motorcycle riding, skiing, football, and rugby with one in five equestrians seriously injured during their riding career. Current research has focused on acute riding injuries but as seen in other sports over-use injuries, repetitive strain and lifestyle could aggravate symptoms causing chronic pain. An elite rider suffering from pain may still choose to compete with pain due to the pressures from sponsors and owners and the need for competition success. The aim of the study was to investigate the prevalence of riders at the elite level competing with pain, and whether they perceived this pain to have a negative effect on their performance. A quantitative approach was used due to the experimental nature of the study. Fifty questionnaires were distributed to elite dressage riders (British Dressage Group 3 and above) at the Festival of Dressage, Hartpury College to establish the prevalence of riders competing with pain. Seventy-four percent of elite dressage riders competed while experiencing pain, 62% of this pain was classed as chronic and 76% of riders stated that this pain was in the low back. Over half (51%) relieved the symptoms of pain by using over the counter pain medication. There was a highly significant relationship between riders competing with pain and the perception that this pain affecting negatively on performance (X^2= 16.216^a, df= 1, p= 0.001). This high incidence of elite dressage riders who compete with pain, particularly lower back pain (LBP), could be problematic given the longevity of a rider's career which can span over four decades. This research reports rider's perceptions and self-reported pain and management options, which may affect the data. Further research is needed to establish the causes of back pain and appropriate management strategies.

Keywords: Equestrian, Dressage riders, chronic pain, lower back pain

Introduction

Equestrian sport is more popular than rugby, fishing, or cricket in the UK and dressage is the fastest growing discipline with British Dressage having over than 14,000 members, 10,000 registered horses and more than 2,000 days of competition per year, (British Dressage, 2016). Equestrianism is a hazardous activity, and is arguably more dangerous than many sports including motorcycle riding, skiing, football, and rugby (Ball *et al.*, 2007). One in five riders experience a serious acute injury during their riding career (Ball *et al*., 2007; Mayberry *et al.*, 2007). Although most equestrian injuries occur as a result of rider falls (Sorli, 2000; Paix, 1999; Bixby-Hammett and Brooks, 1990; Lloyd, 1987), approximately 15% of injuries occur in non-riding activities such as feeding, handling, shoeing and saddling (Maffulli, 2005). Approximately 100 hours of riding experience are required to achieve a substantial decline in injury rate, implying that an elite dressage rider will have endured an injury at some point due to the duration of training a rider must complete in order to reach the elite level (Maffulli, 2005: Mayberry *et al.*, 2007; Sorli, 2000).

Anecdotal evidence suggests that overuse musculoskeletal injuries are common in the elite dressage rider due to the repetitive nature of the training programmes involved; and the

incidence of lower back pain has been reported as high (72%) in horse-riders (Kraft, 2007; Feucht and Patel, 2010; Greve and Dyson, 2013). Kraft (2009) corroborated high prevalence of back pain in equestrians (88%) compared to a non-equestrian control population (33%). To date there are no reports of the prevalence of back pain amongst elite riders of various equestrian disciplines.

Elite dressage riders need to have strong abdominal and back musculature to maintain positional stability. Lower back and/or pelvic pain can reduce the ability to stabilize the lumbar pelvic hip complex around the central longitudinal axis and maintain the correct riding position (Munz et.al 2013; Pelham et al. 2010; Tereda et al. 2000). A strong 'core' anatomy enables the torso to return to equilibrium after perturbation and allows for disassociation of movement between the upper and lower body required for successful application of the 'aids' or signals to the horse. Thus, lower back pain (LBP) can reduce the rider's ability to synchronize with the horse's movement (Tereda *et al.*, 2000).

Additionally, once a professional rider becomes injured, riding, stable duties and lifestyle may aggravate the injury further leaving the rider with regular symptoms of pain (Paix, 1999). Furthermore, Moss *et al*., (2002) suggested that a rider might still compete with an injury due to the pressures from sponsors and owners and the need for competition success to promote the rider and support the rider financially (Robbins, 2012). The aim of the study was to investigate the prevalence of riders at the elite level competing with pain and whether they perceived this pain to have a negative effect on their performance

Materials and Methods

Participants

Fifty questionnaires were distributed to elite female, dressage riders at the Hartpury Festival of Dressage, CDI ***, 3rd-7th July, 2014. Age range 19-52 years. Riders were approached by the researcher and asked to complete the questionnaire post competition. Due to the nature of the purposeful sampling method, all participants were elite dressage riders, who were of British Dressage Rider group 3 and above, ridden to Advanced level and represented their country at either Small or Big Tour (British Dressage, 2015).

Measure

A four section survey was developed containing a mix of closed – response (e.g. Yes/no and Likert scale) and open-response items (Bruce, 2008). Section 1 asked respondents to state their dressage competition level and BD ranking level. Section 2 asked questions related to previous injury and level of pain, location and cause of this pain. Section 3 was specific to the perceived impact this pain had on their performance. Section 4 asked what factors contributed to increased levels of pain when riding (e.g. saddle, movement of the horse, cold weather, yard work). The final section solicited information related to the participants management strategies for dealing with this pain (e.g. over the counter pain medication, prescription pain medication, manual therapy such as physical therapy, chiropractic treatment and other strategies). Validity evidence for the instrument was provided by reviewing the questionnaire for: (1) clarity of wording, (2) use of standard English and spelling (3) reliance of items, (4) absence of biased words and phrases, (5) formatting of items, and (6) clarity of instructions (Fowler, 2002). Two faculty Senior Lecturers experienced in survey design were asked to use these guidelines to review the instrument. Based on the reviewers' comments the instrument was revised and as a pilot study the questionnaire was distributed to 10 competition dressage riders before further revisions were made prior to final administration.

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Data analysis

Descriptive statistics were used to report frequencies and percentages within data. A Chi-square test was conducted to assess associations between variables. An alpha value was set at $p<0.05$ (confidence interval 95%) throughout unless otherwise stated. Data were analysed using SPSS for Windows version 19.

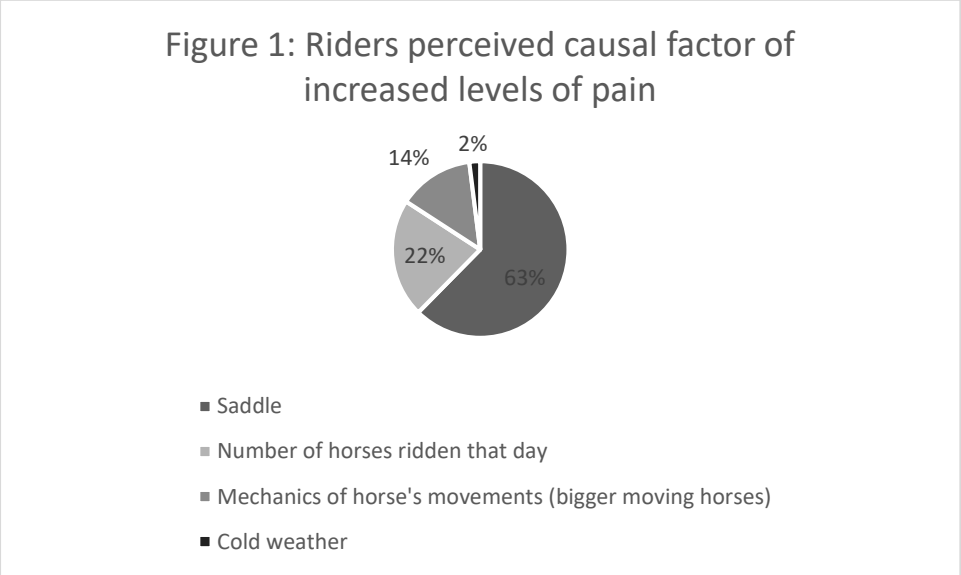
Results

Seventy-four per cent of riders (37/50) reported competing with back pain, additionally, 27 riders (54%) reported having sustained a severe injury (fracture or dislocation) in their career.

Out of the 37 elite dressage riders that experienced pain when competing, 43% of riders experienced pain in relation to a previous injury and 62% of riders reported this pain to be chronic, compared to 38% of riders that reported their pain to be acute.

Lower back pain was reported in 76% of dressage riders, 8% of riders reported pain in the hips, 8% reported pain in the ankle, 5% experienced pain in the shoulder complex and 3% experienced pain in the legs.

The saddle was reported as a causal factor for pain by 62% of riders, 22% of participants believed the number of horses ridden contributed to the pain, 14% to the mechanics of the horse's movement (big moving horses) and 2% felt the cold weather contributed to the pain (Figure 1).



Fifty-nine per cent of elite dressage riders perceived that their pain affected their performance negatively. There was a statistically significant association between those experiencing pain and perceptions of pain affecting negatively on a rider's performance (X^2 (1) = 16.216, p < 0.001). For those riders that perceived their pain negatively affected their performance 55% reported this pain as a distraction when competing, 22% perceived that this pain caused earlier onset of fatigue, and 24% reported this pain specifically affected their effectiveness in 'sitting trot'.

There was a statistically significant association between riders reporting pain and the treatment of pain (X^2 (4) = 50.000, $p < 0.001$). Out of the 37 riders who experience pain when competing 51.4% used medication that was bought over the counter to treat the symptoms of pain, 18.9% used therapy and 16.2% used medication that was prescribed to the rider by a doctor (Figure 2).

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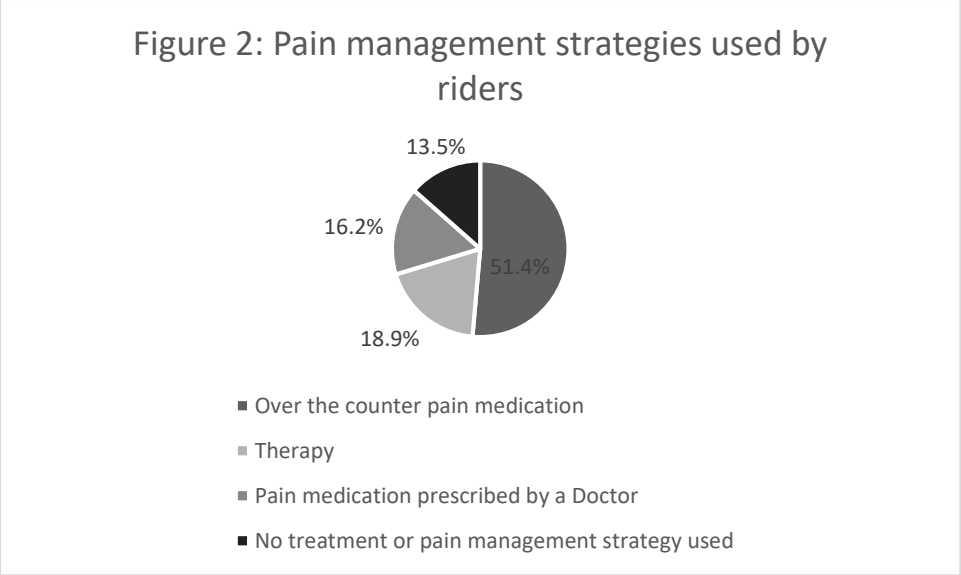

Discussion

The present study identified that, of the 50 elite dressage riders who took part in the study 74% were competing with pain; 54% had sustained a serious fall, resulting in a bone fracture, dislocation or concussion, at some point in their career, similar to the incidence reported by Mayberry *et al.*, (2007); Ball *et al*., (2007) and Moss *et al.*, (2002). However, 57% of the elite dressage riders that experienced pain while competing felt that the pain was not in association with an old or existing injury resulting from a fall. Kraft *et al.,* (2009) determined that most orthopaedic problems experienced by riders related to pain in the lower back and hip joints, which reflects the most common locations of pain reported in the present study. The high proportion of elite dressage riders experiencing chronic LBP is unsurprising due to the cyclic loading nature involved in the training of dressage and the large mechanical forces, which are imposed in the vertical axis of the body from the horse (Kraft *et al*., 2009). Shephard (1997) reported chronic pain in elite sailors was highly prevalent due to the mechanical forces received from the boat and this information may be translated to the dressage rider due to both sports being classified as travel sports where the trunk is required to absorb large forces to remain stable (Douglas *et al.,* 2012). Work by Shephard (1997) reported that sailors are often treated for the symptoms of chronic lower back pain resulting from damage cause by stabilization and endurance based isometric muscular contraction.

Poor endurance of the hip extensor muscle (*Gluteus maximus*) and hip abductors (*Gluteus medius*) has been previously noted in LBP (Nadler, 2000; Kankaanpaa *et al.*, 1998; McGill , 1997). This suggests that fatigue in these muscle groups in connection with LBP may have an impact on the rider maintaining an effective dressage position. Both Symes and Ellis (2009) and Largarde *et al.*, (2005) have suggested that rider pain or stiffness induces rider crookedness and diminishes the rider's ability to follow the movement of the horse both of which are negative to the performance of the dressage rider. Pain during competition is also likely to reduce the rider's ability to ride symmetrically, in rhythm and harmony with the horse (Greve and Dyson, 2013; Kraft *et al*., 2009). Pain experienced in the hip region would decrease the rider's ability to stabilize and control the movement of the pelvis and the dissociation of leg movements when applying the leg aids (Munz *et al.*, 2014), thus impacting on performance.

Fifty-five percent of the riders believed that the pain affected negatively on their performance by causing a distraction to the rider when competing. This result is predictable due to the

repetition of movements that is required at elite level dressage, therefore the rider is likely to continually feel pain throughout their performance. In elite level sports, it is essential that the athlete remains focused throughout the competition so that optimum performance can be achieved (Bernier and Fournier, 2010). If an elite dressage rider is not completely focused, then this increases the risk of mistakes occurring during the test (Bridgman and Terry, 2013).

This study reported that saddle design was perceived to be the main cause of pain experienced by elite dressage riders. This result supports the findings of the study by Quinn and Bird (1996) who also found that saddle design can influence experience of pain in the dressage rider. Further research in saddle design for the dressage rider is needed, as the majority of saddles are designed to suit the shape of the horse and not the conformation of the rider (Greve and Dyson, 2013), suggesting that riders are possibly sacrificing their comfort, for the wellbeing of their horse. It is established that elite dressage riders will need to keep their pelvis closer to the mid-position and further forward in the saddle, in all gaits in comparison to the novice rider (Munz *et al.,* 2014). Therefore, the design of the saddle must allow for the rider to adopt a neutral pelvic tilt to allow for maximum interaction between horse and rider (Munz *et al.,* 2014; Clayton and Hobbs., 2017), whilst limiting the level of pain felt.

Most (86.5%) riders did attempt to manage their pain. The most common method of treating pain stated by the dressage riders in this study was the use of over the counter pain medication. This result is not surprising due to the ease, cost and accessibility that using medication provides (Bahr, 2009; Tsitsimpikou, 2009; Abahussain et al., 2005; Baker and Patel, 2005;). However, the World Anti-Doping Agency (WADA) mission is to achieve clean sport and in order for WADA to achieve this goal, acknowledging the number or dressage riders currently competing with pain would help to evaluate a treatment strategy to ensure that riders have access to therapists and other methods of treating pain rather than self-medicating (WADA, 2014). Currently, some elite dressage riders will have access to physiotherapists through the World Class Programme which is funded through the UK Sport Lottery (BEF 2016). However, regular access and the presence of the physiotherapist at national and international competitions are limited (BEF, 2015).

Equestrian sport is categorized as an early start, late specialization and late maturation sport (BEF, 2015). Considering the longevity of a competitive career in Dressage, the potential for chronic pain issues leading to burnout and dropout need to be carefully considered (Balyi, *et al*., 2013; Bompa, 2009). Therefore, prevention, treatment and management of chronic pain issues are needed for riders, not only in the competition environment but also at home and whilst training.

Conclusion

This study has provided information, which establishes that there is a high incidence of elite dressage riders who compete with pain, particularly lower back pain, which is problematic given the longevity of an equestrian athletes' career, which can span over four decades. This research reports rider's perceptions and self-reported pain and management options, which may affect the data. So further research is needed to establish the causes of back pain and appropriate management strategies.

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